

CLAIMS:

1. A display driver for an electroluminescent display, the display comprising a plurality of electroluminescent display elements each associated with a display element driver circuit, each said display element driver circuit including a drive transistor having a control connection for driving the associated display element in accordance with a voltage on the control connection, the display driver comprising:
 - at least one display element brightness controller to provide an output to drive a said control connection to control the electroluminescent output from a said display element;
 - a voltage sensor to sense the voltage on a said control connection; and
 - a power controller for controlling an adjustable power supply for providing an adjustable voltage to said electroluminescent display to power said drive transistors for driving said display elements, said power controller being configured to provide a control signal to adjust said power supply voltage in response to said sensed voltage.
2. A display driver as claimed in claim 1 wherein said drive transistor comprises a FET transistor and wherein said control connection comprises a gate connection.
3. A display driver as claimed in claim 1 or 2 wherein said display comprises an active matrix display with a plurality of control lines for driving said control connections, and wherein said brightness controller is configured to drive said control lines.
4. A display driver as claimed in claim 3 wherein said voltage sensor is configured to sense the voltage on a said control connection by sensing the voltage on a said control line.
5. A display driver as claimed in any one of claims 1 to 4 wherein said brightness controller comprises a substantially constant current generator.

6. A display driver as claimed in claim 5 wherein the voltage on said control connection is substantially determined by a current level of said substantially constant current generator.
7. A display driver as claimed in claim 6 wherein a said display element driver circuit includes a photodiode, and wherein a photocurrent through said photodiode is determined by said current level to determine the brightness of said display element.
8. A display driver as claimed in claim 5, 6 or 7 wherein said power controller is configured to reduce said power supply voltage when a sensed voltage on a said control connection is less than a threshold voltage.
9. A display driver as claimed in claim 8 wherein said threshold voltage is substantially equal to a maximum available voltage for outputting from said brightness controller to said display.
10. A display driver as claimed in claim 8 or 9 wherein said sensed voltage comprises a voltage on a control connection of a display element having a maximum brightness relative to others of said display elements.
11. A display driver as claimed in any one of claims 1 to 4 wherein said power controller is configured to reduce said power supply voltage to substantially no more than required by a brightest illuminated display element.
12. A display driver as claimed in claim 11 wherein a said display element driver circuit includes a photodiode to reduce said control connection voltage in accordance with the brightness of the associated display element, and wherein said power controller is configured to reduce said power supply voltage when the control connection voltage of the brightest illuminated display element has reduced to less than a first threshold value after a predetermined interval.
13. A display driver as claimed in claim 12 wherein said power controller is further configured to increase said power supply voltage when the control connection voltage

of the brightest illuminated display element has not reduced to less than a second threshold value after said predetermined interval.

14. A display driver as claimed in any preceding claim further comprising said adjustable power supply.

15. A power controller for a display driver for an electroluminescent display, the display comprising a plurality of electroluminescent display elements each associated with a display element driver circuit, each said display element driver circuit including a drive transistor having a control connection for driving the associated display element in accordance with a voltage on the control connection, the power controller comprising:

a memory storing processor control code;

a processor coupled to the memory for executing said processor control code;

a sensed voltage input for sensing a voltage on a said control connection; and

a control signal output for controlling an adjustable power supply for providing an adjustable voltage to said electroluminescent display to power said drive transistors for driving said display elements;

said processor control code comprising instructions for controlling the processor to read said sensed voltage input and to output a control signal to adjust said power supply in response to said sensed voltage.

16. A carrier carrying the processor control code of claim 15.

17. A method of operating an active matrix electroluminescent display, the display comprising a plurality of pixels each with an associated pixel driver, the display having a power supply and plurality of control lines for setting the brightness of each pixel, the method comprising:

setting the brightness pixels of the display using said control lines;

monitoring control lines of the display; and

reducing said power supply responsive to said monitoring.

18. A method as claimed in claim 17 wherein said pixel driver associated with each display pixel includes a drive transistor to drive an electroluminescent display element,

and wherein said monitoring comprises monitoring a control voltage of said drive transistor by monitoring said control lines.

19. A display driver as claimed in claim 18 wherein said drive transistor comprises a FET transistor and said control voltage comprises a gate voltage of said FET transistor.

20. A method as claimed in any one of claims 17 to 19 wherein said monitoring further comprises determining a maximum pixel brightness, and wherein said reducing comprises reducing said power supply to substantially no more than required by said maximum pixel brightness.

21. A method as claimed in any one of claims 17 to 20 wherein said reducing comprises reducing said power supply until said control voltage substantially reaches a maximum available control voltage.

22. A method as claimed in any one of claims 17 to 21 wherein setting the brightness of a pixel of the display comprises setting a current on a said control line.

23. A method as claimed in claim 22 wherein a said pixel driver includes a photodiode and said current comprises a current through said photodiode.

24. A method as claimed in any one of claims 18 to 20 wherein setting the brightness of a pixel of the display comprises setting a pixel brightness voltage on a said control line, wherein a said pixel driver includes a photodiode configured to cause said pixel brightness voltage to decay over time according to the brightness of an associated pixel; and wherein said control voltage comprises said decayed pixel brightness voltage.

25. A method as claimed in claim 24 wherein said reducing of the power supply is responsive to said monitoring establishing that said decayed pixel brightness voltage of a pixel has decayed to less than a first threshold voltage.

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26. A method as claimed in claim 25 further comprising increasing the power supply responsive to said monitoring establishing that said decayed pixel brightness voltage of a pixel has not decayed to less than a second threshold voltage.
27. An active matrix display driver configured to operate in accordance with any one of claims 17 to 26.
28. A display driver as claimed in any one of claims 1 to 17 and 23 or a power controller as claimed in claim 15, or a method as claimed in any one of claims 17 to 26 wherein said electroluminescent display comprises an organic light emitting diode display.